Attachment B: Examples

Reserve Sale Notice
California Cap-and-Trade Program Sale of Greenhouse Gas Allowances from the Allowance Price Containment Reserve (Reserve Sale) on March 8, 2013

Issued on February 6, 2013

This attachment provides information and examples of how to determine the amount of a bid guarantee, how holding limits are applied, and examples of how reserve sales are settled. Allowances purchased at reserve sales are deposited directly into an entity's compliance account. ***Only California covered entities and opt-in covered entities are eligible to participate in reserve sales***.

I. Determining an Entity's Bid Guarantee

Table 1 presents hypothetical bid submissions for a reserve sale in which three entities are participating. Each row in Table 1 provides the bid value at each tier price.

Table 1: Reserve Sale Bid Submissions

Entity Name	Tier Price	Bid Lots	Number of Allowances	Bid Value
A	$ 40.00	500	500,000	$20,000,000
A	$ 45.00	300	300,000	$13,500,000
A	$ 50.00	100	100,000	$5,000,000
B	$ 40.00	750	750,000	$30,000,000
B	$ 45.00	500	500,000	$22,500,000
B	$ 50.00	300	300,000	$15,000,000
C	$ 40.00	200	200,000	$8,000,000
C	$ 45.00	100	100,000	$4,500,000
C	$ 50.00	50	50,000	$2,500,000

Number of Allowances = Bid Lots * 1,000

Bid Value = Number of Allowances * Tier Price

ARB will sell lots of Allowance Price Containment Reserve (APCR) allowances representing a bundle of 1,000 allowances. Only during the tiebreaker process will ARB award less than a bundle of 1,000 APCR allowances. To determine the value of the total bid guarantee when there are bids at different tiers, the following process would apply:

Example 1: Calculating a Bid Guarantee When Submitting Multiple Bids

As shown in Table 1, Entity A has one bid in each of the three tiers. The reserve sale may result in the complete fulfilment of the entity's bid schedule. Thus, the bid guarantee is the sum of each entity's bids.

- Tier 1: Entity A wants to buy 500,000 APCR allowances at a cost of $20,000,000.
- Tier 2: Entity A wants to buy 300,000 APCR allowances at a cost of $13,500,000.
- Tier 3: Entity A wants to buy 100,000 allowances at a cost of $5,000,000.

Entity A's bid schedule shows that it wants to purchase a total of 900,000 APCR allowances at a total bid cost of $38,500,000. **Entity A should submit a bid guarantee of at least $38,500,000 if it wants to buy all the APCR allowances in its bid schedule.**

Entities bidding in a reserve sale will be limited to incurring a total bid cost less than or equal to the dollar amount of their submitted bid guarantee and should evaluate their bids against the bid guarantee they provide in the manner illustrated in this example. Bidders submit a bid guarantee that is used first to satisfy purchases in the lowest-priced tier. Any portion of the bid guarantee remaining after the lowest-priced tier purchases are satisfied is subsequently applied to higher-priced tiers in succession until either all allowances are sold from the APCR or all the qualified bids are filled. A qualified bid refers to a bid used in the reserve sale settlement process after the submitted bids have been evaluated against the holding limits and bid guarantees.

The minimum bid guarantee Entity A, B, and C should submit to avoid having their bids limited by the Reserve Sale Administrator would be as follows:

- Entity A – $38,500,000
- Entity B – $67,500,000
- Entity C – $15,000,000

II. Entity Bid Evaluation Procedures for Purchase Limits and Holding Limits

A. Purchase Limits

There are no purchase limits for reserve sales.

B. Holding Limits

Holding limits are based on the following formula:

Holding Limit = 0.1 * Base + 0.025 * (Annual Allowance Budget – Base)

Where:

“Base” equals 25 million metric tons of Carbon Dioxide equivalent (CO_2e)

“Annual Allowance Budget” is the number of allowances issued for the current budget year.

For 2013, the annual budget is 162,800,000 allowances.

Holding Limit = 0.1 * 25,000,000 + 0.025 * (162,800,000 - 25,000,000)

2013 holding limit = 5,945,000 allowances

C. Maximum Number of Allowances an Entity Can Hold

The holding limit is the maximum number of allowances an entity may have in its holding account or the maximum number of allowances that may be jointly held by a group of entities with a direct corporate association. For the reserve sale, the applicable holding limit is for allowances from the current calendar year, previous calendar years, and allowances purchased from the APCR (section 959209(c)(1) of the Regulation).

A covered entity may exempt a limited number of allowances from the holding limit calculation by transferring them to its compliance account. This “limited exemption” is described in section 95920(d)(2) of the Regulation. The limited exemption is based on an entity’s emissions, and is designed to allow covered entities to accumulate the allowances they need for compliance. For that reason, it is increased on October 1 of each year by the amount of emissions contained in the most recent verified emissions data report. The limited exemption is decreased at the end of the year following the close of a compliance period, after the entity has completed its surrender obligation for the compliance period.

The following example presents the methodology to calculate the maximum number of allowances with a vintage year corresponding to the current or previous calendar years and APCR allowances that can be held by an entity.

Example 2: Determining the maximum number of allowances an entity can hold

The maximum number of allowances with a vintage year corresponding to the current or previous calendar years and APCR allowances an entity can hold at one time equals the holding limit as calculated using the formula on page B-2 plus the limited exemption. For example, assuming an entity takes full advantage of the limited exemption, in 2013 this would be:

Maximum Number of Allowances Held = 5,945,000 + Limited Exemption.

Suppose an entity's limited exemption is equal to 4,000,000 metric tons and it holds 1,000,000 allowances in its compliance account. Then the maximum number of allowances the entity can purchase and stay within the holding limit is:

Maximum Number of Allowances that can be Purchased = 5,945,000 + [4,000,000 – 1,000,000] = 8,945,000 allowances.

If APCR allowances are purchased at a reserve sale, the APCR allowances are placed directly in the entity's compliance account. Any allowances in the compliance account in excess of the limited exemption will be considered in the calculation of the entity's account holdings compared to the holding limit. Entities can hold more allowances in their compliance account than allowed under the limited exemption, but this practice will not increase what they can hold in their holding account and comply with the holding limit.

III. Purchase Determinations

A. Bid Evaluation Criteria

The Financial Services Administrator conducts all the financial transactions required for sales in the reserve sale. The Financial Services Administrator designated by the Executive Officer for the quarterly auctions will also serve as the Financial Services Administrator for the reserve sales.

The Reserve Sale Administrator will compare the value of the bids against an entity's bid guarantee and holding limit. Submitted bids that contain bid lots in excess of the holding limit or the value of the bid guarantee will be accepted, in bundles of 1,000 allowances, up to the respective limits. The portion of a submitted bid that is less than or equal to the bid guarantee and also the holding limit (simultaneously) is a qualified bid. For example, if the bid guarantee is satisfied by the purchase of no more than 10,000 allowances and the holding limit is satisfied by the purchase of no more than 25,000 allowances, the qualified bid is less than or equal to 10,000 allowances. Only qualified bids are used in the reserve sale settlement process.

B. Bid Fulfillment

Starting with allowances in the lowest-priced tier, allowances will be sold to entities that submit qualified bids to the lowest-priced tier. Given that each price tier contains a fixed number of APCR allowances there are three potential outcomes for the sale of allowances within each tier:

- The quantity of qualified bids exactly corresponds to the quantity of allowances available in a given tier. All bids are filled and no allowances remain in the tier.

- The quantity of qualified bids exceeds the quantity of allowances in a given tier. This will result in the tiebreaker process detailed in section 95911(e)(5) of the Regulation under which allowances are sold based on each bidder's proportion of all qualified bids.
- The quantity of qualified bids is fewer than the number of allowances in a given tier. This will result in a tier roll-down as detailed in section 95913(g)(4) of the Regulation under which qualified bids from higher-priced tiers are sold allowances at the lower tier price until the number of allowances in the lower-priced tier is exhausted.

1. Tiebreaker Process

Should the sum of qualified bid quantities for any tier exceed the quantity of allowances in that tier, the Reserve Sale Administrator will allocate allowances to entities based on their proportion of qualified bids submitted to that tier. Only qualified bids submitted to the oversubscribed tier (not the total qualified bids placed across the three tiers) will be used to determine an entity's proportion in a tiebreaker process. Each entity's proportion of qualified bids is defined:

Proportion = Entity's Qualified Bid Quantity / Cumulative Qualified Bid Quantity

The proportion is tier specific. Allowances sold to each entity will be:

Allowances Sold = Proportion * Number of Allowances Available in the Tier

Allowances sold are rounded down to the nearest whole allowance. If any residual allowances are left after disbursement, each entity will be assigned a random number. The entity with the lowest random number will be sold the first residual allowance, and any remaining residual allowances will be sold individually to entities from lowest to highest random number.

Example 3: Bid Fulfillment with a Tiebreaker

Examples 3, 4, and 5 represent one reserve sale across Tier 1, 2, and 3, respectively. These examples utilize the bid schedules for Entities A, B, and C in Table 1 and the bid guarantees in Example 1. In this example, the supply of allowances in each tier is 1,000 bid lots equal to 1,000,000 allowances. Example 3 shows the settlement of a reserve sale when there is an excess demand for allowances in a tier. The example shows a tiebreaker in Tier 1 but the methodology is applicable to any tier of the reserve sale.

Table 2 presents the cumulative bids of the three entities for Tier 1. **These entity bids are qualified bids and do not violate the entities' holding limits or bid guarantees.** Each entity has entered a bid guarantee sufficient to cover all bids in the bid schedule in Table 1.

Table 2: Tier 1 Bid Fulfillment with a Tiebreaker

Entity Name	Tier Price	Tier 1 Bid Lots	Qualified Tier 1 Allowances	Proportion	Allowances Sold
A	$ 40.00	500	500,000	0.34482759	344,827
B	$ 40.00	750	750,000	0.51724138	517,241
C	$ 40.00	200	200,000	0.13793103	137,932
Total		**1,450**	**1,450,000**	**1.00**	**1,000,000**

Since the quantity of qualified bids is 1,450,000 allowances and only 1,000,000 allowances are available for sale from Tier 1, a tiebreaker procedure is required. Each entity is sold allowances as a proportion of their qualified bids to the total quantity of qualified bids submitted to the oversubscribed tier. For example, Entity A's qualified bid is 500,000 allowances and its proportion to the total quantity of qualified bids is 500,000/1,450,000 = 0.344822759. The proportion is then multiplied by the number of allowances available and rounded down to the nearest whole allowance, in this case, 0.0344822759 * 1,000,000 = 344,827 allowances. The rounding down of allowances results in 999,999 total allowances sold. To sell the residual allowance, each entity is assigned a random number and the allowance is awarded to the entity with the lowest random number. In this example, Entity C with the lowest random number receives the residual allowance (changing the number of allowances sold to Entity C from 137,931 to 137,932). The total number of allowances sold in Tier 1 and the resulting bid cost of each entity is as follows:

- Entity A – 344,827 allowances at a total cost of $13,793,080
- Entity B – 517,241 allowances at a total cost of $20,689,640
- Entity C – 137,932 allowances at a total cost of $5,517,280

After completing the sale of the lowest-price tier, the Reserve Sale Administrator will proceed to Tier 2, and finally to Tier 3. The total amount spent on allowances is deducted from each entity's bid guarantee, with the remaining bid guarantee applied to the subsequent tier sales. Also, allowances purchased in Tier 1 are deducted from each entity's holding limit. Evaluation of submitted bids in the next tier is based on the remaining bid guarantee and holding limit.

2. An Undersubscribed Tier Sale: The Roll-Down Procedure

If allowances remain in a tier after all qualified bids are filled, the tier is undersubscribed relative to qualified bids. The Reserve Sale Administrator will sell the remaining allowances of the undersubscribed tier by "rolling down" qualified bids from the next higher-priced tier. To accomplish this, the Reserve Sale Administrator evaluates all bids from the next higher-priced tier with respect to the remaining bid guarantee and holding limit of each entity. The bid guarantee evaluation in the “roll-down” procedure is based on the tier price of the lower tier. Then, a random number is assigned to each bundle of 1,000 allowances in a qualified bid. The remaining allowances in the lower-price tier will be sold to bidders in the next tier, starting with the bundle assigned the lowest random number and proceeding in increasing order of random numbers until all the allowances in the lower-priced tier are sold. The price for the allowances sold under this procedure is the price of the tier from which they are sold, not the tier price under which the bid is placed. The remaining bids from the next higher-priced tier, if any, will be sold at that tier price. Bids can roll-down one tier, but cannot roll-down from the highest-price tier to the lowest-price tier.

Example 4: Bid Fulfillment with Excess Tier Allowances

After the sale from Tier 1, detailed in Example 3, the Reserve Sale Administrator moves on to the sale of allowances in Tier 2, where allowances are priced at $45. Table 3 outlines the bids of the three entities for the two remaining tiers.

Table 3: Tier 2 and Tier 3 Allowance Bids

Entity Name	Tier Price	Bid Lots	Qualified Bid Allowances
A	$ 45.00	300	300,000
B	$ 45.00	500	500,000
C	$ 45.00	100	100,000
Tier 2 Total		**900**	**900,000**
A	$ 50.00	100	100,000
B	$ 50.00	300	300,000
C	$ 50.00	50	50,000
Tier 3 Total		**450**	**450,000**

Given a supply of 1,000,000 allowances in Tier 2, there is an excess of 100,000 allowances after the qualified Tier 2 bids have been fulfilled. To sell these remaining allowances, the 450 bid lots in Tier 3 will be split into individual bid lots of 1,000 allowances and each Tier 3 bid lot will be assigned a random number.

The remaining 100,000 allowances in Tier 2 will be sold in bid lots to bidders from Tier 3 starting with the bid lot assigned the lowest random number and proceeding in increasing order. Given 450 bid lots submitted in Tier 3, there will be a total of 450 random numbers assigned to bid lots from bids submitted by the entities. In this example, 100 bid lots for Entity A are assigned random numbers, 300 bid lots for Entity B are assigned random numbers, and 50 bid lots for Entity C are assigned random numbers. The excess Tier 2 allowances will be sold starting with the Tier 3 bid lot assigned the lowest random number and proceeding in increasing order until all 100 excess bid lots have been sold.

Table 4 shows the final result of the roll-down in Tier 2. In the roll-down procedure the 450 Tier 3 bid lots are ranked in ascending order of their assigned random number. Since there are 100 bid lots remaining in Tier 2 after the fulfillment of all qualified bids, the 100 Tier 3 bid lots with the lowest random number will be sold in Tier 2. In this example, 29 bid lots are from Entity A bids, 59 from Entity B bids, and 12 from Entity C bids. These 100 Tier 3 bid lots are filled with Tier 2 allowances.

Table 4: Tier 2 Roll-Down Bid Fulfillment

Entity Name	Tier Price	Tier 2 Bid Lots	Qualified Tier 2 Allowances	Roll-Down Tier 3 Allowances	Allowances Sold
A	$ 45.00	300	300,000	29,000	329,000
B	$ 45.00	500	500,000	59,000	559,000
C	$ 45.00	100	100,000	12,000	112,000
Total		**900**	**900,000**	**100,000**	**1,000,000**

The 1,000,000 allowances sold in the tier sale are sold at a price of $45 regardless of the tier in which the bid was originally submitted (including qualified Tier 3 bids sold allowances from Tier 2). The total number of Tier 2 allowances sold and the resulting bid cost for each entity is as follows:

- Entity A – 329,000 allowances at a total cost of $14,805,000
- Entity B – 559,000 allowances at a total cost of $25,155,000
- Entity C – 112,000 allowances at a total cost of $5,040,000

Example 5: Tier 3 Sale after a Tiebreaker and Roll-Down

The reserve sale continues until either all the allowances in the three tiers are sold or all accepted bids are fulfilled. Given the results from the sale of Tier 1 and Tier 2, the remaining bids and funds left in the bid guarantee for each entity are:

- Entity A – 71 bid lots at $50 with a remaining bid guarantee of $9,901,920
- Entity B – 241 bid lots at $50 with a remaining bid guarantee of $21,655,360
- Entity C – 38 bid lots at $50 with a remaining bid guarantee of $4,442,720

Table 5: Tier 3 Bid Fulfillment

Entity Name	Tier Price	Tier 3 Bid Lots	Qualified Tier 3 Allowances	Allowances Sold
A	$ 50.00	100	71,000	71,000
B	$ 50.00	300	241,000	241,000
C	$ 50.00	50	38,000	38,000
Total		**450**	**350,000**	**350,000**

Table 5 shows the results of the Tier 3 sale. Each entity has their entire Tier 3 qualified bid filled. Tier 3 qualified bids take into account any bid lots that were rolled down and fulfilled in Tier 2. Entity A's bid schedule shows a bid of 100 bid lots in Tier 3. However, 29 of Entity A's Tier 3 bid lots were sold allowances from Tier 2. Therefore, Entity A has 71 qualified bid lots remaining in Tier 3, and is sold 71 bid lots at the Tier 3 price.

Additionally, there are 650,000 allowances that will remain in Tier 3 of the APCR to be offered for sale in subsequent reserve sales. Table 6 presents the total number of APCR allowances sold from all three tiers and the total cost for each entity.

Table 6: Total Allowances Sold to Entities

Entity Name	Tier Price	Allowances Sold	Total Purchase Cost
A	$ 40.00	344,827	$ 13,793,080
A	$ 45.00	329,000	$ 14,805,000
A	$ 50.00	71,000	$ 3,550,000
Entity A Total		**744,827**	**$ 32,148,080**
B	$ 40.00	517,241	$ 20,689,640
B	$ 45.00	559,000	$ 25,155,000
B	$ 50.00	241,000	$ 12,050,000
Entity B Total		**1,317,241**	**$ 57,894,640**
C	$ 40.00	137,932	$ 5,517,280
C	$ 45.00	112,000	$ 5,040,000
C	$ 50.00	38,000	$ 1,900,000
Entity C Total		**287,932**	**$ 12,457,280**

Qualified bids can only be rolled down one tier, and cannot move from the highest-price tier to the lowest-price tier. Take for example, a reserve sale in which 1,000,000 allowances are again sold within each tier. In this hypothetical reserve sale there are no qualified bids in Tier 1, 100,000 qualified bids in Tier 2, and 100,000 qualified bids in Tier 3. All 100,000 qualified bids in Tier 2 will be rolled down and sold at the Tier 1 price. However, even though Tier 1 will still be undersubscribed after this roll-down procedure, qualified bids will not roll-down from Tier 3 to Tier 1. The Tier 1 sale will close with the sale of 100,000 allowances.

The Administrator then moves on to the sale of allowances in Tier 2. However, all qualified Tier 2 bids were fulfilled in the roll-down procedure leaving Tier 2 undersubscribed. This will trigger a second roll-down procedure, in which the 100,000 qualified Tier 3 bids will be rolled down and sold at the Tier 2 price. The Tier 2 sale will close with 100,000 allowances sold at the Tier 2 price. No qualified bids remain for the Tier 3 sale and the remaining 2,800,000 allowances (1,000,000 per tier across 3 tiers less 200,000 sold) will remain in the APCR.

Roll-downs can occur in the first two tiers of the reserve sale, while tiebreakers can occur in all three tiers. No entity in Example 3, 4, or 5 violated their holding limit or bid guarantee. We now turn to examples that outline how violations can alter the results of the reserve sale.

C. <u>Applying the Holding Limit and Bid Guarantee</u>

Example 6: Holding Limit Applied

The maximum number of allowances that can be held by any entity is a functionof the holding limit and an entity's limited exemption.

A holding limit cap is determined for each reserve sale participant. These caps indicate how many allowances a reserve sale participant may acquire before exceeding their holding limit.

The cap for each entity can be determined based on the holding limit, their limited exemption, and their current allowance holdings. Based on the example provided in the holding limits discussion with a limited exemption of 4,000,000 and 1,000,000 allowances in a compliance account, the holding limit cap calculation for the three entities is provided below:

Table 7 outlines the holding limit cap equal to the maximum number of allowances that can be purchased at the reserve sale for each entity.

Table 7: Limited Exemption and Maximum Allowances that can be Purchased

Entity Name	Holding Limit	Limited Exemption	Compliance Account	General Account	Holding Limit Cap
A	5,945,000	4,000,000	1,000,000	7,945,000	1,000,000
B	5,945,000	4,000,000	1,000,000	7,945,000	1,000,000
C	5,945,000	4,000,000	1,000,000	8,245,000	700,000

Using the bid schedule in Table 1, this example presents the outcome of the reserve sale after imposing holding limit caps for all three entities.

Table 8: Tier 1 with Holding Limit Cap Applied

Entity Name	Tier Price	Tier 1 Bid Lots	Qualified Tier 1 Allowances	Proportion	Allowances Sold
A	$ 40.00	500	500,000	0.34482759	344,827
B	$ 40.00	750	750,000	0.51724138	517,241

C	$ 40.00	200	200,000	0.13793103	137,932
Total		**1,450**	**1,450,000**	**1.00**	**1,000,000**

As shown in Table 8, the results of the Tier 1 sale are unchanged as there is no holding limit violation. For example, Entity B's holding limit is 1,000,000 allowances and its bid is only 750,000 allowances. Entity C is sold the residual allowance based on the random number draw (changing the number of allowances sold to Entity C from 137,931 to 137,932). The number of remaining purchasable allowances for each entity is:

- Entity A – 655,173 remaining allowances that can be purchased
- Entity B – 482,759 remaining allowances that can be purchased
- Entity C – 562,068 remaining allowances that can be purchased

Table 9: Tier 2 with Holding Limit Applied

Entity Name	Tier Price	Tier 2 Bid Lots	Qualified Tier 2 Allowances	Roll-Down Tier 3 Allowances	Allowances Sold
A	$ 45.00	300	300,000	87,000	387,000
B	**$ 45.00**	**500**	**482,000**	**0**	**482,000**
C	$ 45.00	100	100,000	31,000	131,000
Total		**900**	**882,000**	**118,000**	**1,000,000**

Table 9 shows that Entity B's scheduled Tier 2 bid of 500,000 allowances (500 bid lots) violates the holding limit of 482,759 allowances following the Tier 1 sale. Submitted bids that contain bid quantities in excess of the holding limit will be accepted in bundles of 1,000 allowances until the limit is met. Thus, only the portion of the bid that is in violation will be rejected, not the entire bid. In the Tier 2 sale, Entity B is sold 482,000 allowances, its maximum qualified Tier 2 bid.

The Tier 2 sale is undersubscribed with only 882,000 qualified Tier 2 allowance bids. As part of the roll-down procedure, the Reserve Sale Administrator checks Tier 3 submitted bids against the remaining holding limit and bid guarantee for each entity. The bid guarantee evaluation in the "roll-down" procedure is based on the tier price of the lower tier, in this case the Tier 2 price.

Due to Entity B's bid being reduced to the qualified bid of 482,000 allowances, a total of 118,000 Tier 2 allowances remain available. In order to sell these excess Tier 2 allowances, qualified Tier 3 bid lots (satisfying both holding limits and bid guarantees) are assigned random numbers and ordered from lowest to highest number. As Entity B's Tier 2 bid violated the holding limit, it has no qualified Tier 3 bid lots. The 150 qualified Tier 3 bid lots of Entity A and Entity C are assigned random numbers. The 118 excess Tier 2 bid lots are sold to the Tier 3 bid lots with the lowest random numbers. In this example, Entity A is sold 87 lots and Entity C is sold 31 lots. The qualified Tier 3 bid for Entity A will then be reduced by 87 bid lots and the qualified Tier 3 bid for Entity C reduced by 31 bid lots as a result of the roll-down.

The total number of Tier 2 allowances sold and the resulting total cost for each entity is as follows:

- Entity A – 387,000 allowances at a total cost of $17,415,000
- Entity B – 482,000 allowances at a total cost of $21,690,000
- Entity C – 131,000 allowances at a total cost of $5,895,000

The remaining allowances that can be purchased by each entity are:

- Entity A – 268,173 remaining allowances that can be purchased
- Entity B – 759 remaining allowances that can be purchased
- Entity C – 431,068 remaining allowances that can be purchased

Table 10 presents the results of the Tier 3 sale. Entity B cannot participate in the final tier of the reserve sale as any additional purchase of a lot of 1,000 allowances would be in violation of the holding limit. Qualified Tier 3 allowances take into account any Tier 3 bid lots rolled-down and fulfilled in Tier 2. Entity A and Entity C have their entire Tier 3 qualified bids fulfilled. With the holding limit caps in this example there are 968,000 allowances that will remain in Tier 3 of the APCR.

Table 10: Tier 3 with Holding Limit Applied

Entity Name	Tier Price	Tier 3 Bid Lots	Qualified Tier 3 Allowances	Allowances Sold
A	$ 50.00	100	13,000	13,000
B	$ 50.00	300	0	0
C	$ 50.00	50	19,000	19,000
Total		**450**	**32,000**	**32,000**

The reserve sale is complete after the Tier 3 sale. Table 11 shows the total number of APCR allowances and the total cost for each entity**.**

Table 11: Total Allowances Sold to Entities with Holding Limit Applied

Entity Name	Tier Price	Allowances Sold	Total Purchase Cost
A	$ 40.00	344,827	$ 13,793,080
A	$ 45.00	387,000	$ 17,415,000
A	$ 50.00	13,000	$ 650,000
Entity A Total		**744,827**	**$ 31,858,080**
B	$ 40.00	517,241	$ 20,689,640
B	$ 45.00	482,000	$ 21,690,000
B	$ 50.00	0	$ 0
Entity B Total		**999,241**	**$ 42,379,640**
C	$ 40.00	137,932	$ 5,517,280
C	$ 45.00	131,000	$ 5,895,000
C	$ 50.00	19,000	$ 950,000
Entity C Total		**287,932**	**$ 12,362,280**

Example 7: Bid Guarantee Applied

Assume for Example 7 that Entities A, B, and C have submitted the bid guarantees outlined in Table 12 to correspond with their bid schedules presented in Table 1. For this example, all submitted bids are within the holding limit for each entity. The results of the sales from the three tiers of the reserve sale are now presented with the bid schedules presented in Table 1 and the bid guarantees of Table 12.

Table 12: Bid Guarantees

Entity Name	Bid Guarantee
A	$ 25,000,000
B	$ 67,000,000
C	$ 12,000,000

The results of the Tier 1 sale, shown in Table 13, are unchanged as there is no bid guarantee violation. Entity C is again awarded the residual allowance (changing the number of allowances sold to Entity C from 137,931 to 137,932).

Table 13: Tier 1 with Bid Guarantee Applied

Entity Name	Tier Price	Tier 1 Bid Lots	Qualified Tier 1 Allowances	Proportion	Allowances Sold
A	$ 40.00	500	500,000	0.34482759	344,827
B	$ 40.00	750	750,000	0.51724138	517,241
C	$ 40.00	200	200,000	0.13793103	137,932
Total		**1,450**	**1,450,000**	**1.00**	**1,000,000**

The amount spent on allowances and the bid guarantee remaining for each entity is as follows:

- Entity A – $13,793,080 spent with $11,206,920 remaining
- Entity B – $20,689,640 spent with $46,310,360 remaining
- Entity C – $5,517,280 spent with $6,482,720 remaining

Given the bid guarantees in Table 12, the results of the Tier 2 sale change as Entity A violates its bid guarantee. Entity A can spend no more than $11,206,920; at $45 per allowance, it can therefore purchase no more than 249,000 allowances ($11,206,920/$45 = 249,042 allowances, rounded down to the nearest thousand allowances). Therefore, Entity A's qualified Tier 2 bid is reduced to 249,000 allowances.

There are qualified bids for a total of 849,000 Tier 2 allowances. Tier 2 is undersubscribed with an excess of 151,000 Tier 2 allowances resulting in a roll-down procedure. Since Entity A's bid guarantee is limiting, it has no qualified Tier 3 bid lots and cannot purchase any allowances through the roll-down procedure. Qualified Tier 3 bid lots (satisfying holding limits and bid guarantees) from Entity B and C are rolled down and sold the remaining Tier 2 allowances. The results of this tier sale are shown in Table 14.

Table 14: Tier 2 with Bid Guarantee Applied

Entity Name	Tier Price	Tier 2 Bid Lots	Qualified Tier 2 Allowances	Roll-Down Tier 3 Allowances	Allowances Sold
A	$ 45.00	300	249,000	0	249,000
B	$ 45.00	500	500,000	125,000	625,000
C	$ 45.00	100	100,000	26,000	126,000

Total		**900**	**849,000**	**151,000**	**1,000,000**

The amount spent on allowances in the Tier 2 sale and the amount remaining in the bid guarantees of each entity are:

- Entity A - $11,205,000 spent with $1,920 remaining
- Entity B - $28,125,000 spent with $18,185,360 remaining
- Entity C - $5,670,000 spent with $812,720 remaining

Entity A cannot participate in the final tier of the reserve sale as any additional purchase of a lot of 1,000 allowances at the fixed tier price would be in violation of the bid guarantee.

Table 15: Tier 3 with Bid Guarantee Applied

Entity Name	Tier Price	Tier 3 Bid Lots	Qualfied Tier 3 Allowances	Allowances Sold
A	$ 50.00	100	0	0
B	$ 50.00	300	175	175,000
C	$ 50.00	50	16	16,000
Total		**450**	**191**	**191,000**

Table 15 presents the results of the Tier 3 sale. Entity A has no qualified Tier 3 bid lots and thus is not sold any Tier 3 allowances. Entity B has 175 bid lots filled at $50. Entity B’s bid schedule shows a bid of 300 lots in Tier 3. However, 125 qualified bid lots were rolled down to Tier 2 leaving only 175 qualified bid lots to be sold in Tier 3.

In the bid schedule, Entity C has a Tier 3 bid of 50 bid lots. In Tier 2 sale 26 qualified Tier 3 bid lots were rolled down, leaving 24 Tier 3 bid lots unfulfilled. However, Entity C only has a qualified Tier 3 bid of 16 bid lots, as fulfilling the submitted Tier 3 bid of 24 bid lots violates the bid guarantee ($812,720/$50 = 16,254 allowances rounded down to 16,000). Bids that are in violation of the bid guarantee and holding limit will be reduced by bundles of 1,000 allowances until the bid achieves compliance with both requirements.

With the bid guarantees outlined in Table 12, 2,191,000 allowances are sold at the reserve sale and 809,000 allowances remain in Tier 3 of the APCR for sale at a later date.

Table 16 presents the total number of APCR allowances sold from all three tiers and the total cost for each entity**.**

Table 16: Total Allowances Sold by Entity with Bid Guarantee Applied

Entity Name	Tier Price	Allowances Sold	Total Purchase Cost
A	$ 40.00	344,827	$ 13,793,080
A	$ 45.00	249,000	$ 11,205,000
A	$ 50.00	0	$ 0
Entity A Total		593,827	$ 24,998,080
B	$ 40.00	517,241	$ 20,689,640
B	$ 45.00	625,000	$ 28,125,000
B	$ 50.00	175,000	$ 8,750,000
Entity B Total		1,317,241	$ 57,564,640
C	$ 40.00	137,932	$ 5,517,280
C	$ 45.00	126,000	$ 5,670,000
C	$ 50.00	16,000	$ 800,000
Entity C Total		279,932	$ 11,987,280